

IX. Dam Breaching and Wetland Ecology

Wetlands are among the most biologically productive natural ecosystems in the world. Beavers play an integral role in establishing and maintaining the wetlands that provide critical environmental functions. Beaver ponds, or impoundments, provide habitat for fish, amphibians, turtles, otters, and many other animals. Trees that are killed by beaver-induced flooding of wooded swamps provide nesting sites for great blue herons, wood ducks, and other birds. Beaver dams hold water within the landscape, maintaining local groundwater levels and providing flow to streams during even the driest portion of the summer season.

The wetlands that beavers create support not only an abundance of animal and plant life, but they also serve many vital functions that benefit humans as well. Beaver habitat improves water quality by acting as a settling basin, controls flooding and reduces erosion by slowing water movement, processes organic wastes, removes toxins like pesticides and fertilizers, filters runoff, and protects against droughts. Beaver created wetlands are dynamic, rich environments that go through regular cycles with different ecological values at each stage. For example, after wetlands age and beavers abandon them, they are transformed into fertile meadows supporting a myriad of plant and animal life.

Partially or completely breaching beaver dams can have negative impacts on all of the species inhabiting the impoundment. Conservation commissions should allow only the minimum amount of beaver dam removal necessary to abate an immediate public health, safety, or property damage threat. Usually, this means allowing the removal of a small section of the top of the dam, down to a specific elevation (typically no more than two feet below the top of the dam).

Seasonal issues should be addressed in conservation commission's conditions. For example, in the fall turtles and amphibians enter a resting state for the winter season. Many of these animals will be present in shallow muddy areas around the edges of the beaver pond. If the water level is drawn down during the fall or winter, these animals can be killed due to exposure to freezing conditions. Similarly, if water levels drop below the entrances to the beaver's lodge, they too will be exposed to freezing air. Beavers also may lose access to their food caches, either because the cache is exposed and freezes, or because the lodge entrances are now above frozen, lower water levels. This is an inhumane way to address the beaver problem, leaving them to a slow death from cold and starvation. Whenever possible, fall and winter drawdowns should be strictly conditioned and limited to prevent these kinds of impacts.

X. GIARDIA

Giardia lamblia is a common, single-celled parasite, which can cause an illness of the intestines known as Giardiasis. The disease can be found throughout the world and is widespread among mammalian, avian, and reptile species; including humans, companion animals, wildlife, sheep and cattle, and wading birds.

TRANSMISSION

Giardia goes through two stages: during the trophozoite stage, or "active" stage, it is in the intestine of the host and cannot survive on its own. It becomes infectious when it enters the tough, protected cyst stage, and is shed in the feces of the host. In the cyst form, *Giardia* can be killed between 54-56° C (dies instantaneously at boiling point, 100° C), but it can last 2-3 months in cold water (<10° C).

When humans become sick with *Giardia*, the *Giardia* parasite is predominantly spread via person-to-person contact. Due to poor hygiene practices, it can often result in transmission in developing nations, day-care facilities, and institutional settings. Contamination of food and water sources from human or animal infected fecal material is also a means of transmission.

SYMPTOMS

Symptoms of the disease usually appear from nine to twelve days after exposure; however, they can appear within five to twenty-five days. Some people don't show any signs of illness at all although they may still shed the parasite. The disease is characterized by numerous intestinal symptoms that can last from one week to a few months, and may include diarrhea, flatulence, abdominal cramping and discomfort, fatigue, and weight loss.

TREATMENT

Treatment is available through prescribed antibiotics. Some individuals recover without the need for medication.

GIARDIA AND BEAVER

Research has shown that *Giardia* of human origin can be transmitted to several wildlife species. More research is needed, however, to determine the role wildlife plays in transmitting *Giardia* to humans. Being a highly visible species in watersheds, the beaver has often been unfairly implicated as the source of *Giardia* contamination of fresh water resources. The term "beaver fever" is often used to describe waterborne outbreaks. However, current research shows that contamination from humans is regarded as a more probable source. In fact, humans are now considered to be the most common reservoir, as they shed 900 million cysts per day. There has never been a proven, documented case of a human contracting *Giardia* from beaver. Many studies claiming to have done so lack any scientific evidence in support of the claims.

Giardia from human sources can enter waterways by many different methods, such as washed-out septic systems, untreated human sewage discharged into waterways, cabin toilets, and backpackers and campers who inadvertently deposit contaminated feces in the environment that is washed away

by rain and ends up in rivers and streams. Near highly used human recreational areas, studies are showing that there are increased Giardia cysts in surface water and wildlife.

PREVENTION

You can protect yourself and your family from Giardiasis using preventative measures, such as good personal hygiene including frequent hand washing and wearing gloves when handling possible contaminated materials. Careful disposal of sewage wastes and protecting water supplies from human, companion animal, and wildlife contamination is also important. Avoid drinking water that has not been treated or filtered, and carry treated water (boiling water is most effective) or equipment for purifying water with you when you are hiking or camping.

For more information contact the MSPCA's Living With Wildlife Program at 617.522.7400.

ADDITIONAL RESOURCES:

Erlandsen, S.L., Macechko, P.T., vanKeulen, H., Jarroll E.L. "Beaver and Giardia in the Environment: A Current Perspective on the Existence of 'Beaver Fever'." University of Minnesota School of Medicine and Cleveland State University. 17 pp.

"Giardiasis." 1997. Hadidian, J, Hodge, G., and Grandy, J. (eds.), *Wild Neighbors*. Colorado: Fulcrum Publishing. 16-17.

Hilton, H. 1990. "Giardiasis: A Bum Rap For Beaver?" *Maine Fish and Wildlife*. Spring, 1990. 13-15.

Connaughton, D. 1989. "Giardiasis - zoonosis or not?" *Journal of the American Veterinary Medical Association*. Vol. 194, No. 4, February 15. 447-449, 451.

Miya, E. and Tuthill, B. (eds.) 1995. "Water filters & Giardia Distilled Wisdom." 29 pp.
<http://www.fc.net/~tdecagan/water/one.html>

"Giardiasis (beaver fever)." 1999. *New York State Department of Health Communicable Disease Fact Sheet*. 2 pp.
<http://www.health.state.ny.us/nysdoh/consumer/giardia/htm>.

"Giardiasis." 1998. *General Health Encyclopedia*. 3pp.
<http://www.healthcentral.com/mhc/top/000288.cfm>.

Mass. DPH Fact Sheet
<http://www.state.ma.us/dph/cdc/Fsgiar.pdf>



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Beavers in Massachusetts



Introduction

The beaver is a valuable component of Massachusetts' fauna. Not long ago the beaver was absent from the state. In fact, it was absent from the late 1700s to the early 1900s. Beavers are semi-aquatic mammals spending approximately 80% of their time in water. They feed on aquatic vegetation and twigs from trees. Their lodges and dams are built from trees. As early Massachusetts farmers cleared the land for pasture and cropland, beaver habitat disappeared. Habitat recovered in the early 1900s when farming was more lucrative in the fertile Midwestern United States. Our forests continue to provide excellent beaver habitat, and the beaver has been restored to the Commonwealth.

This webpage is intended to provide you with biological information about beaver as well as laws and regulations that involve dealing with nuisance beaver and recreational harvest. When the beaver population was fairly low in Massachusetts, MassWildlife concentrated on the many beneficial aspects of this large rodent. By damming streams, beavers expand wetlands which provide important filtration for groundwater as well as valuable wildlife habitat. As the beaver population increases and people build residential and commercial developments, adverse impacts from beaver damming activity increases. It is, therefore, critical that people know how to live with beaver in their environment.

In 1996, the voters of Massachusetts passed a ballot referendum known as "Question One". Among other things, the law prohibited or restricted (by permit only) many types of traps. MassWildlife managed the beaver population by allowing a regulated harvest of beavers by licensed trappers. This annual harvest dropped from approximately 1,700 to less than 100 beavers. Consequently, the beaver population experienced exponential growth from 1996 to some 70,000 today.

In 2000 the Massachusetts Legislature modified Question One making it easier for people to obtain permits for beaver removal for public health or safety problems due to beaver flooding. In this website you will find all of the material necessary to guide you through this law and the process for obtaining permits. If you need additional assistance, we encourage you to contact any *MassWildlife* office.

Informational Links

- [Guidance for Conservation Commissions](http://www.mass.gov/dfwele/dfw/dfw_beaver_law.htm)
 Massachusetts Department of Environmental Protection
 (DEP) guidelines for Conservation








Commissions concerning beaver-related work in wetlands.

- **SOP - Control of Beavers Near Public Water Supply Sources** - DEP standard operating procedure determining threats by beavers to public water supplies.
- **Problem Animal Control (PAC) Specialists** - *MassWildlife* statewide list of licensed Problem Animal (PAC) agents.
- **Massachusetts Beaver Law** - Full version of Massachusetts General Laws Chapter 131 Section 80A.
- **Information for Beaver Regulations in Massachusetts** - Provided by the Massachusetts Department of Health (DPH) Bureau of Environmental Health Assessment.

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Publications

- **Process for Obtaining Emergency Permit and Appeal** (175 KB) 
- **Beavers in Massachusetts** (4.8 MB) 
- **Summary: Beaver Biology & Behavior** (514 KB) 
- **The Use of Water Flow Devices in Addressing Flooding Problems Caused by Beaver in Massachusetts** (3.4 MB) 
- **Managing Nuisance Beavers Along Roadsides - A Guide for Highway Departments** (239 KB) 



Note: All of the above publications are in PDF format. You will need Adobe Acrobat Reader to view them. [Click here for more information on obtaining the free Acrobat Reader.](#)

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Frequently Asked Questions

Q: Beavers are flooding my property. What do I do?

A: Ask your local Board of Health to assess the damage and advise you of your options. If the damage is not deemed a threat to human health or safety, contact your *MassWildlife* District office.

Q: My yard is flooding, but the beavers are not located

http://www.mass.gov/dfwele/dfw/dfw_beaver_law.htm



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on my property. Is there anything that I can do to control the flooding?

A: Go to the property owner and explain your situation. In most cases permission is granted for certain techniques. Permits must be obtained from your local Board of Health before any action can be taken. The application will require a signature from the property owner where the dam exists.

Q: What methods are available for the control of beavers?

A: There are a variety of non-lethal and lethal options available for the control of beaver damage. A hand approach may be used when beaver activity does not negatively affect the homeowner. Exclusion fencing is used to prevent tree damage, and permits may be obtained for the breaching of dams and installation of valves to control water levels. Trapping beavers is also an option. There is a legal trapping season from 1-April 15 when any licensed trapper may trap beavers. Beavers may also be trapped out of season with permits. Please refer to publications.

Q: Why do beavers cause flooding?

A: Beavers are a semi-aquatic species that are well adapted to life in the water. They rely on aquatic habitats for food, protection from terrestrial predators, and shelter in winter. Beavers are herbivorous and eat on the bark, branches and leaves of trees as well as aquatic vegetation. They use the indigestible parts of wood for dam and lodge building. Beavers enhance their habitat by increasing the size of the beaver pond. It is important to note that an increase in water level may result in flooding of roads, driveways, yards, and other areas used by humans.

Q: How do I prevent beavers from chewing my trees?

A: Hardware cloth or heavy gauge wire fencing can be installed surrounding the bottom of trees. The wire should be a minimum of 4 feet tall and flush with the ground. Do not wrap the wire tightly around the tree as beavers will try to chew through it. Instead, leave a 6-inch space between the tree and the wire.

Q: I have never had beavers on my property before, why now?

A: Since the passage of the trapping referendum (Question 1) in 1996, the beaver population has tripled in Massachusetts. Beavers have few natural predators and therefore population control is minimal. Each year 3-5 young are born and stay with the adult pair for two years before dispersing to find new territories of their own. As the population continues to increase, beavers will continue to find and create new wetland habitats.

Q: Do I need a permit during the trapping season to control beavers?

A: Any licensed trapper may trap beavers during the regular trapping season from November 1-April 15. If you are on property other than your own, you must register your traps with MassWildlife. To obtain a trap registration you must first attend a trapper education class. For information contact the Hunter Education Program of MassWildlife at (508)792-7434.

Q: How much does it cost to hire a trapper to trap beavers on my property?

A: Many people are now charging a fee for their trapping services. Prices for trapping beavers may vary, so be sure to shop around. Either licensed trappers or licensed Problem Animal Control (PAC) Agencies provide this service.

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Trapping Information

Furbearer & Trapping Management Regulations --- This links you to the trapping, hunting and fishing regulations. Click on Trapping to get to the most current regulations document. All registered trappers receive these regulations.

http://www.mass.gov/dfwele/dfw/dfw_beaver_law.htm

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Other copies are available at *MassWildlife* District Offices.

CHANGE IN TRAPPING SEASON FOR BEAVER--Note, since the printing of the trapping abstracts, an EMERGENCY REGULATION was promulgated, changing the length of the beaver trapping season. The season begins November 1 and ends on April 15.

Mass. General Laws Chapter 131: Inland Fisheries and Game and Other Natural Resources---This is an e listing the statutes, use your back button to return to the *MassWildlife* home page.

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MASSWILDLIFE
RULES AND REGULATIONS RELATIVE TO THE USE OF CERTAIN TRAPS FOR THE TAKING OF FUR-BEARING MAMMALS AND TO BREACH ANIMAL DAMS
(Plain Language Summary)

1. Purpose: These regulations govern the possession and use of certain traps for the taking of fur-bearing mammals, and the breaching of beaver and muskrat dams or the installation of water flow devices to prevent certain types of animal damage. The regulations implement the provisions of M.G.L. c. 131, § 80A, amended by c. 139, St. 2000.
2. Definitions: Several terms are defined as specifically used in the regulations. Certain of the most important include:
 - Fur-bearing mammals includes all mammals as defined in G.L. c. 131, § 1.
 - Permissible traps include cage or box type traps, common type mouse and rat traps, and net traps.
 - Prohibited traps include all traps except permissible traps.
 - Restricted traps include Conibear-type traps.
3. Prohibitions Regarding Trap Use: Except as provided in these regulations, a person shall not use, set, maintain, or possess any prohibited trap for the taking of fur-bearing mammals.
4. Health and Safety Exception: The Department of Public Health, the U.S. Public Health Service, or a municipal board of health may use prohibited traps for the purpose of protection from threats to human health and safety.
5. Threats to Human Health and Safety: Threats to human health and safety may include, but are not limited to, beaver or muskrat: (a) occupancy of a public water supply; (b) flooding of drinking water wells, wellfields, or water pumping stations; (c) flooding of sewage beds, septic systems, or sewage pumping stations; (d) flooding of public or private ways, driveways, railways, or airport runways or taxiway; (e) flooding of electrical or gas generation or telephone plants, transmission or distribution facilities, or public utilities; (f) flooding affecting public use of hospitals, emergency clinics, nursing homes, health care facilities for the elderly, or fire stations; (g) flooding affecting hazardous waste sites of facilities, incineration or recovery plants, or other situations which may result in the release of hazardous materials; (h) gnawing, chewing, etc. of electrical or gas generation equipment, cables, or facilities; and (i) flooding or structural instability on the applicant's property when such animal problem poses an imminent threat of substantial property damage or income loss including: 1. flooding of buildings or facilities, 2. flooding or restriction of access to commercial agricultural lands affecting the normal practices on those lands, 3. reduction

production of a commercial agricultural crop resulting from flooding or compromised structural st
4. flooding of residential lands when the board of health determines this is a threat to human health safety.

6. Permits to Use Restricted Traps: A person or his agent can obtain a permit to use restricted traps from (a) from the municipal board of health, in situations involving threats to human health and safety, or (b) from the DFW director in non-emergency situations.
7. Permits involving Human Health and Safety: The municipal board of health may give the applicant a 10-day permit to: (a) use restricted traps, (b) breach dams or dikes, subject to conditions of the municipal conservation commission, or (c) install water flow devices, subject to the conditions of the municipal conservation commission.
8. Denial of Permit: If the municipal board of health denies the permit, the applicant may appeal to: (a) the Department of Public Health, if the denial involves a question as to human health and safety, or (b) the DFW director, if the denial involves a question as to whether the damage was caused by beaver or muskrat.
9. Extension Permits: If the 10-day emergency permit does not solve the animal problem, the applicant's approval of the board of health, shall apply to DFW for a 30-day extension permit.
10. Management Plans: If the DFW director determines that the 30-day extension should be issued, he shall, within 30 days, develop an alternative, non-lethal management plan to address the situation. The plan shall be developed with the participation of the applicant, the board of health, and the conservation commission. The plan is to describe long-term solutions, using barriers, fencing, water flow devices, continued use of traps, or other options appropriate to the situation. DFW is to provide such technical assistance as is necessary to implement the plan.
11. Additional Emergency Permits: If the initial 10-day emergency permit does not solve the animal problem, the applicant or his agent may apply to the board of health for additional emergency permits. The applicant shall state in writing that either: (a) he has attempted and failed to control the situation with alternative, non-lethal means or permissible traps, or (b) he has applied for, but not yet received, a 30-day extension from the DFW director.
12. Authorizations under such Additional Emergency Permit: A person may receive only 2 additional emergency permits, each valid for 10 consecutive days. The first allows the use of any of the means allowed under the initial permit. The second allows only dam breaching and installation of flow devices. Such emergency permit expires upon the issuance of a 30-day extension permit by the DFW director.
13. Non-Emergency Permits: In situations not involving threats to human health and safety, a person may apply to the DFW director for a permit either to use restricted traps, to breach a beaver or muskrat dam or to install water flow devices. Dam breaches or installation of flow devices must also be approved by the municipal conservation commission.
14. Procedures for Obtaining Non-Emergency Permit: Upon receipt of an application to use restricted traps, the DFW shall review the situation and may make a field inspection. If issuance of a permit is warranted, the applicant must: (a) demonstrate that he has used permissible traps for at least 15 consecutive days and has failed to abate the problem, and (b) has attempted to use alternative, non-lethal methods and has failed to abate the problem. The director may then issue a permit to use restricted traps for up to 30 consecutive days. The applicant shall make a report to DFW after the period is up. If the problem is still not solved, the applicant may again go through the entire process to obtain another permit.

15. Review of Problem Situations: When an animal complaint is received, DFW shall determine the nature of the problem, and direct problems relating to human health and safety, which may necessitate the use of traps or dam breaches, to the board of health. Situations not involving human health and safety, or necessitating restricted traps or dam breaches, shall be handled in accordance with DFW practice.
16. Subregulatory Guidelines: The Department of Public Health, and the Department of Environmental Protection, in consultation with DFW, have prepared guidelines for boards of health and conservation commissions, to aid them in the implementation of these regulations and §80A. These guidelines have been mailed to all municipalities, and will be posted on the DFW website. Sample permits and forms made available in like manner.

Note: This is not the complete law and is subject to change. Refer to the Rules and Regulations relative to the Use of Traps for the Taking of Fur-bearing Mammals in the Code of Massachusetts Regulations, 321 CMR 2.08, as well as c. 131, § 80A and other relevant provisions of the General Laws.

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Questions? Comments? Contact: *MassWildlife* at Mass.Wildlife@state.ma.us

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Massachusetts Department of Fish and Game

Executive Office of Environmental Affairs

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